

Series: Mathematics - from zero to engineer (12).

Conversion from the decimal system to another number system.

Binary form.

$$245_{10} = 11110101_2$$

remainder

245 : 2	1
122 : 2	0
61 : 2	1
30 : 2	0
15 : 2	1
7 : 2	1
3 : 2	1
1 : 2	1
0	

↑

Octal form.

$$524_{10} = 1014_8$$

remainder

524 : 8	4
65 : 8	1
8 : 8	0
1 : 8	1
0	

↑

Duodecimal form.

$$897_{10} = 629_{12}$$

remainder

897 : 12	9
74 : 12	2
6 : 12	6
0	

↑

Converting a fraction in the decimal system to octal and duodecimal form.

$$0,526_{10} = 0,4152_8$$

↓	0,526 · 8	→ we multiply only the fractional part.
	4,208 · 8	
	1,664 · 8	
	5,312 · 8	
	2,496	

$$0,306_{10} = 0,3809_{12}$$

↓	0,306 · 12	→ we multiply only the fractional part.
	3,672 · 12	
	8,064 · 12	
	0,768 · 12	
	9,216	

Convert to the octal system.

$$492, 731_{10} = 754, 5662_8$$

remainder

$$\begin{array}{r} 492 : 8 \\ 61 : 8 \\ 7 : 8 \\ 0 \end{array}$$

$$\begin{array}{r} 4 \\ 5 \\ 7 \end{array} \uparrow$$

$$\begin{array}{r} 0,731 \cdot 8 \\ 5,848 \cdot 8 \\ 6,784 \cdot 8 \\ 6,272 \cdot 8 \\ 2,176 \end{array} \downarrow$$

Convert to the duodecimal system.

$$384, 426_{10} = 280, 5142_{12}$$

remainder

$$\begin{array}{r} 384 : 12 \\ 32 : 12 \\ 2 : 12 \\ 0 \end{array}$$

$$\begin{array}{r} 0 \\ 8 \\ 2 \end{array} \uparrow$$

$$\begin{array}{r} 0,426 \cdot 12 \\ 5,112 \cdot 12 \\ 1,344 \cdot 12 \\ 4,128 \cdot 12 \\ 1,536 \cdot 12 \\ 6,432 \end{array} \downarrow$$